

App. No. 09/682,059

In the Claims:

1-24 (cancelled)

25. (new) A distributed control system consisting of a plurality of interconnected control units, each capable of performing specific tasks or subtasks.

26. (new) A distributed control system in claim 25 further comprising said control system has the following attributes: i) distributed control logic; ii) fault tolerance; iii) security; and iv) distributed control;

27. (new) A distributed control system in claim 26 further comprising the attributes of said control system being mutually exclusive.

28. (new) A distributed control system in claim 25 further comprising Logic Control Units (LCUs), each one being primarily composed of a plurality of control devices grouped together, and having the following attributes: tasks or subtasks may be performed on a plurality of control units as if on a single control unit; a LCU may either comprise a single basic control device, or several basic control devices clustered together, or even enclosing other LCUs, resulting in an LCU having higher processing power capabilities; and all control units in a LCU having equal hierarchy.

29. (new) A distributed control system in claim 26 further comprising said Distributed Logic is a set of dynamic rules that determine the relationship among control units; and said rules develop automatically from the on-going operation of said distributed control system..

30. (new) A distributed control system in claim 26 further comprising each said control unit following the rules of said Distributed Logic adopts a pending task or subtask that is most

App. No. 09/682,059

suitable for its processing abilities.

31. (new) A distributed control system in claim 25 further comprising said fault tolerance consisting of two parts: detection of faulty system components; and automatic substitution of faulty system components.

32. (new) A distributed control system in claim 25 further comprising said fault tolerance uses a peer-based means for fault detection, in which a fault-monitoring task is dynamically distributed among all control units in the network..

33. (new) A distributed control system in claim 25 further comprising where if one of said control units fails to perform a task or subtask, then that task or subtask is passed to and executed by another interconnected control unit.

34. (new) A distributed control system in claim 25 further comprising where said fault tolerance involves virtual control unit replacement by virtue of which: a faulty control unit will be told to suspend operation; said faulty control unit will further be reported as non-operative to the distributed control system; another control unit capable of executing the tasks or subtasks will further request to execute previously assigned tasks to be executed by said faulty control unit; said faulty control unit will further transfer its currently assigned task or subtask to a requesting control unit; and subsequently said requesting control unit will execute said tasks or subtasks.

35. (new) A distributed control system in claim 25 further comprising said security consisting of using a secure communication protocol implementing data encryption and controller authentication means.

App. No. 09/682,059

36. (new) A method that encloses or complements existing distributed control systems comprising the steps of: having a plurality of interconnected control units, with each capable of performing specific tasks or subtasks.

37. (new) The method in Claim 37 further comprising said control system has the following attributes: i) distributed control logic; ii) fault tolerance; iii) security; and iv) distributed control.

38. (new) The method in Claim 38 further comprising the attributes of said control system being mutually exclusive.

39. (new) The method in Claim 37 further comprising logical organizational units (LCUs), each one being primarily composed of a plurality of control devices grouped together, and having the following attributes: tasks or subtasks may be performed on a plurality of control units as if on a single control unit; a LCU may either comprise a single basic control device, or several basic control devices clustered together, or even enclosing other LCUs, resulting in an LCU having higher processing power capabilities; and all control units in a LCU having equal hierarchy.

40. (new) The method in Claim 38 further comprising said Distributed Logic is a set of dynamic rules that determine the relationship among control units; and said rules develop automatically from the on-going operation of said distributed control system..

41. (new) The method in Claim 38 further comprising each said control unit following the rules of said Distributed Logic adopts a pending task or subtask that is most suitable for its processing abilities.